

REMARKS

Claims 1-98 are pending. In the Office Action date January 6, 2005, the Examiner issued a restriction requirement. The Examiner contends that the claims of the above-referenced application are related to the following two distinct inventions:

Group I: "Claims 1-30 and 79-90, drawn to processes for separating and liquefying a natural gas stream, classified in class 62, subclass 620"; and

Group II: "Claims 31-78 and 91-98, drawn to an apparatus for separating natural gas with an automatic control system, classified in class 62, subclass 628".

The Examiner contends that the Groups relate to each other as a process and an apparatus for practicing the process but that they are distinct because the process, as claimed", can be practiced by another materially different apparatus or by hand" and "the apparatus as claimed can be used to practice another and materially different process".

In response, Applicants elect Group I, claims 1-30 and 79-90, which are drawn to processes.

The Examiner has further asserted that the "application contains claims directed to the following distinct species of the claimed invention":

I) "Claims 1 or 31 which claim a distillation column having one input for an expanded feed";

II) "Claims 2 or 32 which claim a distillation column having a gas inlet and a liquid inlet for the feed stream";

III) "Claims 3 or 33 claiming a distillation column with two inlets for a gaseous feed stream";

IV) "Claims 4 or 34 claiming a distillation column having a condensed feed stream as well as an expanded gas feedstream and an expanded liquid feedstream";

V) "Claims 5 or 35 claiming a distillation column which has the feed stream separated into a vapor stream, a liquid stream and a combined stream";

VI) "Claims 6 or 36 claiming a vapor feedstream which is separated into two streams with one being condensed and the other expanded, with both streams fed to the column";

VII) "Claims 7 or 37 which claim a stream which is separated into a liquid and a gas with the gas stream further separated into a stream which is condensed and feeding all three streams into a distillation column";

VIII) "Claims 8 or 38 claiming separating a feedstream into a gas and liquid, separating the gas, expanding one of the gas streams and forming a combined stream with the second gas stream and the liquid stream, condensing the combined stream and feeding the combined stream and the gas stream into a distillation column";

IX) "Claims 9 or 39 claiming separating a feedstream into a gas and a vapor, feeding the liquid to a distillation column and combining the gas from the separated feed stream and the gas from the distillation column";

X) "Claims 10 or 40 claiming separating the feedstream into a first gas and first liquid, separating the first vapor stream into a second vapor and a second gas stream, feeding the liquid streams to a distillation column and combining the gas from the column with the second vapor stream to produce the product stream";

XI) "Claims 11 or 41 claiming directing the feed steam to a contact device to produce a first liquid and a first vapor, feeding the liquid to a distillation column and using part of the vapor from the column after condensation, in the contact device";

XII) "Claims 12 or 42 claiming separating the feed into a first liquid and a first vapor, feeding the vapor to a contact device, and feeding the liquid from the contact device and the first liquid to a distillation column and condensing a portion of the vapor from the column for return to the contact device";

XIII) "Claims 13 or 43 claiming feeding the feedstream to a contacting device to produce a first liquid and a first vapor, feeding the first liquid to a distillation column, cooling and separating the vapor from the column into a second liquid and second vapor, feeding the second liquid to the contacting device and combining the first and second vapor stream into a product stream";

XIV) "Claims 14 or 44 claiming separating a feed into a first liquid and first vapor, feeding the first vapor to a contacting device to form a second vapor and second liquid, feeding both liquid streams into a distillation column, cooling and separating the gas from the column into a third liquid and third vapor and using the combined second and third vapor as the product stream";

XV) "Claims 15 or 45 claiming separating a feed into a liquid and vapor in a contacting device, condensing the vapor as a product stream, feeding the liquid to a distillation column and feeding a portion of the vapor from the column to the contacting device after it has been condensed";

XVI) "Claims 16 or 46 which claim separating a feed into a vapor and liquid, feeding the vapor to a contacting device, heating the liquid from the contacting device and feeding it and the liquid from the first separation into a distillation column, using the vapor from the column as a product";

XVII) "Claims 17 or 47 which claim directing the feed to a contacting device to form a first liquid and first vapor, directing the first liquid into a distillation column, cooling and separating the vapor produced in the column to form a second vapor and a second liquid, feeding the second liquid to the column and contacting device and combining the first and second vapor to form a product stream to be cooled";

XVIII) "Claims 18 or 48 claiming separating a feed into a first liquid and first vapor, feeding the first vapor into a contacting device to form a second vapor and a second liquid, heating the second liquid and expanding the first liquid and feeding both into a distillation column, cooling and separating the gas from the column into a third vapor and third liquid, forming a cooled product stream from the second and third vapor streams";

XIX) "Claim 49 which claims feeding a stream into a distillation column pulling a fluid from a central portion of the column and cooling and separating it and using the gas from the separation and the gas from the top of the column to form a product stream to be cooled";

XX) "Claim 50 which claims separating a feedstream into a liquid and a gas which are then expanded and fed to a central portion of a distillation column, extracting a vapor from a central portion of the column and cooling and separating it and feeding the

vapor derived therefrom and the vapor from the top of the column to a cooler to provide cooled product”;

XXI) “Claim 51 which claims cooling and expanding a feed stream which is fed mid-column to a distillation column, extracting a gas from below the feed level, cooling and separating the gas to provide a liquid which is fed back to the level that the gas was derived from and a gas which is combined with the gas from the top of the column to provide the product”;

XXII) “Claim 52 which claims cooling and separating a feedstream into a first vapor and a first liquid which are fed mid column to a distillation column, withdrawing a vapor stream from the column and cooling and separating it to form a second vapor and a second liquid, feeding the second liquid back to the column at the level that the vapor was removed, and combining the second vapor with vapor removed from the top of the column to form a product stream”;

XXIII) “Claim 53 which claims feeding a stream to a central portion of a column, deriving gas product from the column and deriving liquid from the column which is heated and fed back to the column at a level below the level that the vapor is derived from;

XXIV) “Claim 54 which claims deriving a vapor from a central portion of a distillation column, expanding and cooling the vapor to form a product stream which is combined with product from the top of the column and a liquid stream which is delivered back to the column, withdrawing a liquid feed from the column, heating the liquid and returning it to a level below the level from which the vapor was removed”;

XXV) "Claim 55 which claim withdrawing a vapor from a distillation column and cooling and separating stream into a product vapor stream and a liquid stream which is fed back to the column in the vicinity from which the vapor was removed, withdrawing a liquid stream above where the vapor stream is derived, heating the liquid stream and returning it to the column below where the vapor stream is derived; and

XXVI) "Claim 56 which claims separating a stream into gas and liquid portions, expanding both streams and feeding them to a distillation column, withdrawing a vapor from the distillation column and cooling and separating stream into a product vapor stream and a liquid stream which is fed back to the column in the vicinity from which the vapor was removed, withdrawing a liquid stream above where the vapor stream is derived, heating the liquid stream and returning it to the column below where the vapor is derived."

The Examiner also states that the "dependent claims follow the independent claims from which they depend".

The Examiner contends that under 35 U.S.C. 121 Applicants are required to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted should no generic claim be finally found allowable. The Examiner regards claim 57 as generic to all of the apparatus claims. The Examiner further regards claim 58 as generic to claims 32, 34, 35, 37, 38, 50, 52 and 56.

The Examiner contends that a reply to the Office Action must include an identification of the species that is elected consonant with the requirement, and a listing of all claims readable thereon, including any claims subsequently added.

Applicants respectfully traverse the required election of species. Applicants believe that several of the species identified by the Examiner should be grouped together. In particular, it is Applicants' view that Groups XV, XVI, XVII, and XVIII should be grouped together as relating to a single species.

Generally, the present invention relates to a process, as well as an apparatus, for liquefying natural gas in conjunction with producing a liquid stream containing predominantly hydrocarbons heavier than methane. In the process, the natural gas stream to be liquefied is partially cooled, expanded to an intermediate pressure, and supplied to a distillation column. The bottom product from this distillation column preferentially contains the majority of any hydrocarbons heavier than methane that would otherwise reduce the purity of the liquefied natural gas.

Each of process claims 15, 16, 17 and 18 relate to a process for liquefying a natural gas stream employing a contacting device and a distillation column wherein a gas or vapor stream is intimately contacted with a liquid stream in the contacting device. The utilization of such a contacting device/distillation column arrangement is described in U.S. Patent No. 5,771,712 which is owned by the assignee of the instant application. A copy of the '712 patent is provided herewith. In the '712 patent, such a contacting device/distillation column arrangement is disclosed in processes and apparatuses for separating a gas stream containing methane, C₂ components, C₃ components and heavier hydrocarbon components into a volatile residue gas fraction containing a major portion of the methane and C₂ components and a relatively less volatile fraction containing a major portion of the C₃ components and heavier hydrocarbon components.

The invention patented in the '712 patent is known as the assignee's Improved Overhead Recycle ("IOR") process and apparatus. Instant application claims 15, 16, 17 and 18 reflect the Applicant's discovery that IOR features may be incorporated in processes for liquefying natural gas streams to achieve improved results. In view of the common IOR features in claims 15, 16, 17 and 18, Applicants respectfully request that they be regarded as relating to a single species and that they be grouped together for examination. Claims 19, 24, 29, 30, 79, 82, 85 and 88 are multiple dependent claims that depend on, *inter alia*, claims 15, 16, 17 and 18.

Should the Examiner maintain the grounds for election of species as provided in the Action, then Applicants provisionally elect species XVIII with traverse. As indicated above, Applicants believe claims 15-19, 24, 29, 30, 79, 82, 85 and 88 are readable on species XVIII.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,771,712
DATED : June 30, 1998
INVENTOR(S) : Campbell et al.

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 24, claim 10.

Line 16, "third" should read -- second --

Signed and Sealed this

Eleventh Day of December, 2001

Attest:

Nicholas P. Godici

Attesting Officer

NICHOLAS P. GODICI
Acting Director of the United States Patent and Trademark Office